Complete Clean Set of Claims

9. (twice amended) A process for the isolation of nucleic acids from a sample comprising the following steps:

(a) applying at least one nucleic acid sample to a non-siliceous surface;

(b) immobilizing the nucleic acids of the nucleic acid sample on the non-siliceous surface in the presence of a compound selected from the group consisting of a salt of a metal and/or ammonium cation with a mineral acid, a salt of a mono or polybasic or polyfunctional organic acid with an alkaline or alkaline-earth metal, a hydroxy-functional compound of an aliphatic or acyclic saturated or unsaturated hydrocarbon, a phenol or polyphenol, a chaotropic agent, and combinations thereof, wherein the nucleic acids are reversibly immobilized on the non-siliceous surface;

(c) releasing the immobilized nucleic acids from the non-siliceous surface with an elution agent, characterized in that the release takes place at a temperature T, whereby $10°C \geq T \geq T_{S,EM}$, and $T_{S,EM}$ equals the freezing point of the elution agent.

10. The process according to Claim 9, characterized in that the release takes place at temperature T, in which $10°C \geq T \geq 5°C$.

11. (amended) The process according to Claim 9, characterized in that the release takes place at temperature T, in which $10°C \geq T \geq 0°C$.

12. (amended) The process according to Claim 9, characterized in that the release takes place at temperature T, in which $10°C \geq T \geq -5°C$.

13. The process according to Claim 9, characterized in that the release takes place at temperature T, in which $5°C \geq T \geq T_{S,EM}$.

20. (amended) The process according to Claim 9, characterized in that after the release step at least one additional step takes place:

- performing at least one chemical reaction with the nucleic acids.

37. (amended) The process according to Claim 9, characterized in that the sample is introduced onto the top of the surface.

38. (amended) A process according to Claim 9, characterized in that the immobilized nucleic acids are subjected to a washing step which takes place with at least one washing buffer after the immobilization and before any release steps.

39. (amended) The process according to Claim 38, characterized in that the washing step consists of the following steps for each washing buffer:

- applying a predetermined quantity of washing buffer on the non-siliceous surface; and
- passing the washing buffer through the non-siliceous surface.

40. (amended) The process according to Claim 9, characterized in that an aqueous salt or buffer solution is used to release the nucleic acids.

41. (amended) The process according to Claim 9, characterized in that water is used to release the nucleic acids.

42. (amended) The process according to Claim 9, characterized in that the application and immobilization of the nucleic acids includes the following steps:

mixing at least one nucleic acid-containing sample with an immobilization buffer;

applying said at least one nucleic acid-containing sample with the immobilization buffer to the non-siliceous surface; and

passing the liquid components through the non-siliceous surface in essentially the same direction they were added.

43. (amended) The process according to Claim 9, characterized in that at least one of the steps is carried out by an automatic device, in a fully automatic manner.

44. The process according to Claim 43, characterized in that all steps of the process are performed by an automatic apparatus in a controlled sequence.

45. The process according to Claim 43, characterized in that a majority of nucleic acid isolations or reactions take place simultaneously.

46. (amended) The process according to Claim 9, characterized in that aqueous salt solutions of metal and/or ammonium cations with mineral acids are used to immobilize the nucleic acids.

47. The process according to Claim 46, wherein the aqueous salt solutions are of alkaline halides, alkaline-earth halides, alkaline sulfates, alkaline-earth sulfates, alkaline phosphates, alkaline-earth phosphates, or mixtures thereof.

48. (amended) The process according to Claim 46, wherein the aqueous salt solution is selected from the group consisting of sodium halides, lithium halides, potassium halides, magnesium sulfate, and combinations thereof.

49. (amended) The process according to Claim 9, characterized in that aqueous solutions of salts of mono or polybasic or polyfunctional organic acids with alkaline or alkaline-earth metals are used to immobilize the nucleic acids.

50. The process according to Claim 49, characterized in that aqueous solutions of sodium, potassium or magnesium salts with organic dicarboxylic acids are used to immobilize the nucleic acids.

51. The process according to Claim 50, characterized in that the organic dicarboxylic acid is oxalic acid, malonic acid and/or succinic acid.

52. The process according to Claim 49, characterized in that aqueous solutions of sodium or potassium salts with a hydroxy or polyhydroxycarboxylic acid are used to immobilize the nucleic acids.

53. The process according to Claim 52, characterized in that the polyhydroxycarboxylic acid is citric acid.

54. (amended) The process according to Claim 9, characterized in that hydroxy-functional compounds of aliphatic or acyclic saturated or unsaturated hydrocarbons are used for the immobilization of the nucleic acids.

55. The process according to Claim 54, wherein said hydroxy-functional compounds are selected from the C_1-C_5 alkanols.

56. The process according to Claim 55, wherein said alkanols are selected from methanol, ethanol, n-propanol, tert.-butanol, pentanols, and mixtures thereof.

58. (amended) The process according to Claim 9, characterized in that a phenol or polyphenol is used for the immobilization of the nucleic acids.

59. (amended) The process according to Claim 9, wherein at least one chaotropic agent is used for the immobilization of the nucleic acids.

60. The process according to Claim 59, characterized in that the chaotropic agent is a salt selected from the group of trichloracetates, thiocyanates, perchlorates, iodides, guanidinium hydrochloride, guanidinium isothiocyanate, and urea.

61. The process according to Claim 59, characterized in that 0.01 molar to 10 molar aqueous solutions of at least one chaotropic agent by itself, or in combination with other salts, is used to immobilize the nucleic acids.

62. The process according to Claim 61, characterized in that 0.1 molar to 7 molar aqueous solutions of at least one chaotropic agent by itself, or in combination with other salts, is used to immobilize the nucleic acids.

63. The process according to Claim 62, characterized in that 0.2 molar to 5 molar aqueous solutions of at least one chaotropic agent by itself, or in combination with other salts, is used to immobilize the nucleic acids.

64. The process according to Claim 61, wherein the chaotropic agent is selected from an aqueous solution of one or more of sodium perchlorate, guanidinium hydrochloride, guanidinium isothiocyanate, sodium iodide and potassium iodide.

65. The process according to Claim 38, wherein washing steps are carried out using salt or buffer solutions selected from aqueous salt solutions of metal and/or ammonium cations with mineral acids, including alkaline halides, alkaline-earth halides, alkaline sulfates, alkaline-earth sulfates, alkaline phosphates, alkaline-earth phosphates, or mixtures thereof; aqueous solutions of salts of mono or polybasic or polyfunctional organic acids with alkaline or alkaline-earth metals, including sodium, potassium or magnesium salts of organic dicarboxylic acids including oxalic acid, malonic acid and succinic acid; aqueous solutions of sodium or potassium salts of a hydroxy or polyhydroxycarboxylic acid including citric acid; hydroxy-functional compounds of aliphatic or acyclic saturated or unsaturated hydrocarbons including C_1-C_5 alkanols and aldites; phenols or polyphenols; one or more chaotropic agents including salts selected from the group of trichloracetates, thiocyanates, perchlorates, iodides, guanidinium hydrochloride, guanidinium isothiocyanate, and urea.

66. (amended) The process according to Claim 9, characterized in that the non-siliceous surface is a membrane.

67. The process according to Claim 66, characterized in that the membrane is a hydrophobic membrane.

68. The process according to Claim 67, characterized in that the hydrophobic membrane consists of a polymer with polar groups.

69. The process according to Claim 67, characterized in that the membrane is a hydrophilic membrane with a hydrophobic surface.

70. The process according to Claim 67, characterized in that the membrane is made of nylon, a polysulfone, polyethersulfone, polycarbonate, polypropylene, polyacrylate, acrylic copolymer, polyurethane, polyamide, polyvinylchloride, polyfluorocarbonate, poly-tetrafluoro-ethylene, polyvinylidene fluoride, polyethylene-tetrafluoro-ethylene-copolymerisate, a polyethylene-chlorotrifluoro-ethylene-copolymerisate, cellulose acetate, nitrocellulose, polybenzimidazole, polyimide, polyacrylnitrile, polyacrylnitrile-copolymer, cellulose-mix ester, cellulose nitrate, or polyphenylene sulfide.

71. The process according to Claim 70, characterized in that the membrane consists of hydrophobic nylon.

72. The process according to Claim 71, characterized in that the membrane is coated with a hydrophobizing coating agent selected from the group of paraffins, waxes, metal soaps, optionally containing additives selected from the group of aluminum or zirconium salts, quaternary organic compounds, ureic derivates, lipid modified resins, silicones, zinc organic compounds and glutaric dialdehyde.

73. (amended) The process according to Claim 66, wherein the membrane is a hydrophilic membrane or a membrane made hydrophilic by pre-treatment.

74. The process according to Claim 73 characterized in that the membrane consists of hydrophilisized nylon, polyethersulfone, polycarbonate, polyacrylate, acrylic copolymer, polyurethane, polyamide, polyvinylchloride, polyfluorocarbonate, poly-tetrafluoro-ethylene, polyvinylidene fluoride, polyethylene-tetrafluoro-ethylene-copolymerisate, a polyethylene-chlorotrifluoro-ethylene-copolymerisate, cellulose acetate, polypropylene, nitrocellulose,

polybenzimidazole, polyimide, polyacrylnitrile, polyacrylnitrile-copolymer, cellulose-mix ester, polyester, polysulfone, cellulose nitrate, or polyphenylene sulfide.

75. (amended) The process according to Claim 66, characterized in that the membrane has a pore diameter of 0.001 to 50 micrometer.

112. (amended) The process according to Claim 9 wherein said non-siliceous surface comprises a material selected from the group consisting of cellulose acetate; non-carboxylized, hydrophobic polyvinylidene fluoride; and massive, hydrophobic polytetrafluoroethylene.

113. The method of Claim 112, wherein said material is used in the form of a membrane.

114. The method of Claim 112, wherein said material is used in the form of a granulate.

115. The method of Claim 112, wherein the material is used in the form of a fiber.

116. The method of Claim 115, wherein the fibers are organized as a fleece.

121. The process according to Claim 62, wherein the chaotropic agent is selected from an aqueous solution of one or more of sodium perchlorate, guanidinium hydrochloride, guanidinium isothiocyanate, sodium iodide and potassium iodide.

122. The process according to Claim 63, wherein the chaotropic agent is selected from an aqueous solution of one or more of sodium perchlorate, guanidinium hydrochloride, guanidinium isothiocyanate, sodium iodide and potassium iodide.

123. The process according to Claim 68, characterized in that the membrane is a hydrophilic membrane with a hydrophobic surface.

124. The process according to Claim 68, characterized in that the membrane is made of nylon, a polysulfone, polyethersulfone, polycarbonate, polypropylene, polyacrylate, acrylic copolymer,

polyurethane, polyamide, polyvinylchloride, polyfluorocarbonate, poly-tetrafluoro-ethylene, polyvinylidene fluoride, polyethylene-tetrafluoro-ethylene-copolymerisate, a polyethylene-chlorotrifluoro-ethylene-copolymerisate, cellulose acetate, nitrocellulose, polybenzimidazole, polyimide, polyacrylnitrile, polyacrylnitrile-copolymer, cellulose-mix ester, cellulose nitrate, or polyphenylene sulfide.

125. (new) The process according to Claim 9 for the isolation of nucleic acids from a sample further comprising, prior to step (a), the step of adjusting said at least one nucleic acid sample to binding conditions that permit reversible immobilization to a non-siliceous surface, and wherein there is a pretreatment of said at least one nucleic acid sample before and/or after adjusting the binding conditions of said at least one nucleic acid sample.

126. (new) The process according to Claim 125, wherein said pretreatment is selected from the group consisting of salting out, filtration, centrifugation, enzymatic treatment, temperature adjustment, precipitation of non-nucleic acid material, extraction, homogenization, mechanical reduction, binding of contaminants to surfaces, and combinations thereof.

127. (new) The process according to Claim 125, wherein said binding conditions permit reversible immobilization of RNA.

128. (new) The process according to Claim 125, wherein said binding conditions permit reversible immobilization of DNA.

129. (new) The process according to Claim 9, wherein said non-siliceous surface is a material in the form selected from the group consisting of a membrane, a granulate, and a fiber.